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March 5, 2002

Mr. Rodney Struck
Oregon Department of Environmental Quality
2020 SW 4th Avenue, Suite 400
Portland, Oregon 97201

**Subject: Marine Terminal 1 South
Response to Review Comments on Human Health and Ecological
Risk Assessment
ECSI File No. 2042**

Dear Mr. Struck:

The Port of Portland (Port) has prepared the following response to the Oregon Department of Environmental Quality (DEQ) review comments on the Marine Terminal 1 (T1) South Human Health and Ecological Risk Assessment, as documented in your letter dated February 12, 2002. The Port's response to DEQ's general and specific comments (in *italics*) are summarized below.

General Comments

A. *It is important to note that the divisions for the risk assessment do not match the preliminary plans for the future development submitted to DEQ on November 12, 2001. The proposed site plans show many smaller lot divisions. For example, Area A is further divided in A1, A2, and A3, and B and C are similarly divided. It is important to adequately address potential hot spot areas (e.g., B-37, B-5 and B-29) that may have one building built over them, and evaluate these separately so exposure point concentrations are not diluted over a larger area. This becomes especially important when high concentrations in one isolated area are stated as not being representative of the larger data set, when in fact they may be representative of development and future use.*

An overlay figure is needed showing future development and contaminant concentrations. In addition, once redevelopment plans are prepared areas that will be excavated (i.e., cut) and areas that will be filled should be identified. Further risk assessment or sampling may be required if soils not currently evaluated as surface soil are brought to the surface and distributed.

Response: The Risk Assessment has considered the current and reasonably likely future land use at this site as is required under DEQ and EPA Guidance. These include a mix of residential and commercial uses. We have provided quantitative risk and hazard estimates for exposure to the following receptors; residents, commercial

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workers, and utility/excavation workers. The division of the site into Areas of Concern (AOCs) was clearly delineated in the Risk Assessment Work Plan, and the baseline risk assessment did not deviate from these AOCs. It is not feasible to run risk calculations (or conduct further risk assessments) for every possible permutation of building development that may occur at this property and this suggestion runs contrary to existing guidance. Also, it should be noted that soil contamination exceeding hot spot criteria has only been detected at the B-68 and B-92 sample locations, as will be documented in the feasibility study.

- B.** *Total Petroleum Hydrocarbon (TPH) and Diesel data (presented in Table 2-A) should be further discussed in terms of risk. If risk cannot be analyzed quantitatively, then it should be further addressed qualitatively in Sections 3.3 and 3.4 (uncertainty analyses).*

Response: The Human Health Risk Assessment provides a quantitative evaluation of TPH risks based on the indicator approach. The indicators refer to single compounds within TPH known or believed to be carcinogenic and non-carcinogenic. This is consistent with EPA's risk assessment guidance. Additional language will be added to the uncertainty section describing the indicator approach highlighting the fact that this assesses the most toxic components of petroleum mixtures but recognizing the uncertainty due to the many constituents in TPH.

- C.** *The risk assessment estimates the exposure point concentrations (EPCs) for groundwater using a single monitoring event. EPCs should be estimated using more than one data point. The uncertainty in the groundwater EPCs should be addressed in Section 3.4.*

Response: The monitoring well groundwater data used to calculate EPCs were based on all of the seven groundwater monitoring well samples collected between September 28 and October 1, 2001, and represent seven data points rather than the one data point mentioned in DEQ comment. An additional round of groundwater monitoring was completed in January 2002 and documented in the Groundwater Sampling Report dated February 26, 2002. The additional data will be incorporated into revised EPCs for groundwater for future risk calculations.

- D.** *If available, future development plans should be submitted to show where potential ecological habitat could exist after site redevelopment. Given the city's greenway requirements, vegetation could be added that is not currently present.*

Response: Future development plans will be provided if available.

Specific Comments

- 1. Page 8, Section 2.4.1.** *The locality of the facility should include Willamette River sediments if known contamination from the site has migrated or has the potential to migrate there. Data previously collected adjacent to the T-1 facility should be summarized in this report. If contaminants at the site are determined to have the potential to migrate to the Willamette River, this should be stated in the RA.*

Response: It is our conclusion that while groundwater has the potential to migrate to the Willamette River, the concentrations of compounds of interest (COIs) in

groundwater are below conservative screening levels and are, therefore, below any levels of concern from the aquatic perspective. There is no reason to believe that any unacceptable conditions could have resulted in the Willamette River based on the groundwater monitoring results. The Preliminary Assessment completed at this site also concluded, "there is a low potential for upland activities to have resulted in releases to the Willamette River via storm water discharges". There appears to be no transport mechanism present at this site that would result in unacceptable concentrations of COIs being transported to the Willamette River. Therefore, consistent with the "locality of the facility" defined in the DEQ approved RI, the Willamette River sediments remain outside the "locality of the facility" for this site. Sediments will be addressed in the Lower Willamette River Superfund Site project.

2. Page 2.10, Section 2.6, COPCs. PCBs are listed as COPCs in paragraph 2 of this section and are not mentioned again. Please add text regarding the elimination of PCBs as COPCs. They are not included in the screening process or data tables.

Response: PCBs were never detected in any of the soil samples evaluated as part of this risk assessment and were not identified as COPCs. Text will be added to the report documenting this fact.

3. Page 13, Section 3.1, Potentially Exposed Populations. DEQ requests that since the site is going to be redeveloped, that a construction worker scenario be included in the risk assessment to adequately assess site risk. This scenario should include an evaluation of soils down to at least 10 feet below ground surface. The following exposure factors should be used in this evaluation:

•	Exposure Frequency	25 days/year
•	Exposure Duration	1 year
•	Soil Ingestion Rate	330 mg/day
•	Inhalation Rate	cubic meters/day
•	Body Weight	70 kg
•	Lifetime	70 years

Response: The excavation worker scenario evaluated in this risk assessment is very similar to the construction worker scenario proposed by the DEQ. The risks and hazards associated with the construction worker, based on the exposure factors presented above, would be between two and three times greater than the excavation worker risks and hazards presented in Table 10. There were no unacceptable risks predicted for the excavation worker, and we do not believe additional calculations are warranted. Risks and hazards for the construction worker would still be well below the DEQ target risk and hazard levels. However, a brief discussion of the construction worker exposure scenario will be included in the uncertainty section. It should be noted that the inhalation rate for the proposed construction worker was not included in the DEQ comment letter, and we have assumed this to be equal to the excavation workers' inhalation rate. The Port and Hart Crowser would like to get the references and justification for the construction worker exposure factors presented above.

4. Page 14, Section 3.1.2, Exposure Point Concentration. Please add appropriate tables to the Risk Assessment Report that document what data was used in the calculation of the EPCs including statistics, graphs showing the distribution, and other appropriate information.

Response: The soil and groundwater data used to calculate the EPCs are presented in Appendix A. Table 4 presents the descriptive (including the distribution of each data set) and quantitative statistics associated with each AOC, COPC, and depth interval. Because the data set distributions were determined analytically (i.e., via the Shapiro and Wilk W-Test), it was determined that graphical representations of each distribution were not necessary.

5. **Page 15, Section 3.1.2, Area A.** *It is stated that the arithmetic mean of 0.37 mg/kg was used instead of the 90% UCL (0.35 mg/kg) for the exposure point concentration for benzo(a)anthracene. The mean should not be higher than the calculated 90th percentile EPC unless different data sets were used, which is inappropriate. The elevated detection of 9.35 mg/kg should not be omitted from the EPC calculation. Per OAR 340-122-084(1)(f), the EPC must be the 90th percentile upper confidence on the mean. However, if the 90th percentile EPC is higher than the maximum value, DEQ accepts the maximum as the EPC.*

Response: The 90% UCL was in fact less than the arithmetic mean for benzo(a)anthracene for Area A Total Soil. The maximum detected concentration of 9.35 mg/kg, which is significantly higher than the remaining benzo(a)anthracene detections, contributed to the 90% UCL being less than the arithmetic mean. In addition, the 90% UCL of 0.35 mg/kg for benzo(a)anthracene is consistent with the 90% UCLs for the remaining carcinogenic PAHs. Consistent with DEQ guidance, the maximum detected concentration of benzo(a)anthracene was used to calculate the 90% UCL. Section 3.1.2 presents a complete discussion of the distribution analysis procedure. For this COPC, the use of the maximum detected concentration of benzo(a)anthracene will be used as the RME concentration for total soil as this will not change the conclusion of no unacceptable risk to the excavation worker at Area A. We will recalculate the risk for the excavation worker using the maximum detected concentration of benz(a)anthracene.

6. **Page 15, Section 3.1.2, Area A, Lead:** *Lead was identified as a contaminant of concern for Area A, and should be carried through the risk assessment and added to the appropriate tables (e.g., Table B-1).*

Response: The lead evaluation is presented in Section 3.3.2.4. Lead was not included in Tables B-1 through B-3 because there are no toxicity factors available for lead. The purpose of Tables B-1 through B-3 are to estimate potential risks and hazards associated with exposure to COPCs, which is not possible for lead since there are no lead toxicity factors available. The lead risk evaluation for Area A is detailed in Section 3.3.2.4 of the report.

7. **Page 15, Section 3.1.2, Area B.** *The data from B-63 should be further discussed and the rationale for omitting it included in the Risk Assessment. Elevated detection limits alone are not adequate rationale for deleting data. Instead of omitting the data from B-63 because of high detection limits, this could suggest that additional sampling is needed. This point also corresponded with high TPH and diesel concentrations.*

Response: EPA's Risk Assessment Guidance for Superfund (RAGS) addresses the issue of elevated sample quantitation limits. In Chapter 5.3.2, RAGS states one can "exclude the samples from the quantitative risk assessment if they" (i.e., referring to

elevated SQLs) "caused the calculated concentration (i.e., the concentration calculated according to guidance in Chapter 6) to exceed the maximum detected concentration for a particular data set." The 90% UCLs for all the PAH COPCs exceed their respective maximum detected concentration when the elevated SQLs of 67 mg/kg are retained in the data sets. Therefore, the exclusion of the elevated SQLs is consistent with EPA risk assessment guidance.

8. **Page 19, Section 3.2.4.** *The list of indicator compounds should include all the compounds analyzed in TPH samples. For example, some PAHs, while screened out as compounds of concern (COC), should be added to this list for a discussion of the qualitative risks associated with TPH. Excluded PAHs include phenanthrene, acenaphthylene, benzo(ghi)perylene, and fluoranthene. Naphthalene is listed twice.*

Response: All PAHs analyzed for in TPH samples will be included in the second bullet in Section 3.2.4. The second reference to naphthalene will be removed.

9. **Page 26, Section 3.4. Chemical Characterization.** *It should be noted that limited data have been collected from Areas B and C. The sampling method (e.g., non-probabilistic, biased, directed, random) and the uncertainty in estimating exposure point concentrations, based on these data sets, should be presented. Specifically in Area B, seven (7) surface soil samples were analyzed for PAHs from 0 to 3 feet in Area B and six (6) samples were analyzed for Arsenic (Table 4). Three (3) soil samples were collected in Area C, and only one was taken at the surface (the other two were at 10 and 11 ft.). These were only analyzed for metals, and not PAHs.*

Response: The sampling conducted in the RI was based on a directed sampling strategy and was approved by DEQ. While there is uncertainty in limited sampling, sampling was conducted in areas where contamination was most likely to exist. There was no reason to believe contamination was present to warrant additional soil or groundwater sampling in these areas. This fact will be reported in the Uncertainty Analysis in Section 3.2.1.

10. **Page 29, Section 4.2.** *DEQ requires response letters from the U.S. Fish and Wildlife Service (USFWS), the Oregon Department of Fish and Wildlife (ODFW), and the National Marine Fisheries Service (NMFS) in addition to the Oregon Natural Heritage Program. This is to avoid omitting protected species. Several species appear to be missing from the list. For example, the Bald Eagle is not included.*

Response: DEQ has approved Level 1 Scoping Ecological Risk Assessments previously using the Oregon Natural Heritage Database search outputs as a surrogate for contacting USFW, NMFS, and ODFW. This has been particularly true on sites that do not contain "sensitive environments" as defined by OAR Chapter 340, Division 122-045. The conclusion of the Level 1 Scoping ERA is that there is very limited habitat present at the site, and there is no potential for exposure to ecological receptors at the T1 South Site regardless of the presence or absence of additional threatened and endangered species. The site is almost entirely paved or covered with buildings and provides very limited habitat for ecological receptors. The Oregon Natural Heritage Program provided a list of 11 State and Federal threatened and endangered species, and neither sensitive environments nor evidence of these species were found at this

site. The identification of additional threatened and endangered species would not change the conclusions of the Level 1 Scoping ERA.

11. *Tables B-1 through B-9. Hazard quotients should be calculated for all compounds in addition to the theoretical cancer risk.*

Response: Hazard Quotients and Hazard Indices are presented in Tables B-1 through B-9. The Hazard Quotients are in the middle (horizontally) of each table and are located between the Hazard Intake and Cancer Intake estimates. The Total Hazard Index for each exposure pathway presented at the end of each table and are the sum of the individual Hazard Quotients.

12. *Tables B-1 through B-4, Volatilization Exposure Point Concentrations. The calculation of exposure point concentrations for indoor air needs to be documented and described.*

Response: The indoor air exposure point concentrations were calculated using the modeling equations presented in DEQ's risk-based decision making guidance. Additional detail on these calculations will be presented in Section 3.1.2.

13. *Table 11. The RME values for the excavation worker need to be included.*

Response: The purpose of Table 11 was to provide more detailed information for exposure scenarios that had either a total RME cancer risk greater than 1×10^{-5} or an individual COPC RME cancer risk greater than 1×10^{-6} . The excavation worker risk and hazard estimates did not meet either of these criteria and, therefore, the excavation worker was not included in Table 11. A footnote will be added to Table 11 to clarify the purpose of this table.

14. *Figure 3. What do future plans show as far as beach / water access? Does it support the Conceptual Site Model?*

Response: Site redevelopment plans are evolving and undergoing the City land use and permitting approval process. Except for potential boat or ship access at the existing concrete pier located at Berth 104, plans for beach or water access have not been proposed as part of site redevelopment.

15. *Figure 4. The ecological site model should show the sediment / aquatic link. There are contaminants in groundwater that could potentially migrate to sediment and result in exposure to aquatic organisms (sediment and groundwater ingestion and dermal contact). In addition, a potentially complete pathway to terrestrial receptors for soil contact should be indicated (dermal and ingestion). While the current exposure may currently be limited, potential future habitat after site redevelopment is unknown.*

Response: The risk-based screening of groundwater data against conservative DEQ Ecological Screening Levels indicated there are no constituents present in groundwater at levels to cause any adverse impacts to aquatic receptors. While it is possible that constituents may migrate to sediment, there is no reason to further evaluate this pathway. There are currently no potential exposure pathways to terrestrial receptors from soil because the site is almost entirely paved or covered in buildings. The future

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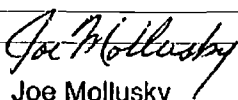
development for this site calls for a mix of residential/commercial activities and there will be no additional potential for terrestrial receptor exposure, as the site will be developed for commercial/residential use, inconsistent with the presence of quality habitat.

16. Appendix D, Attachment 2: Question 2, "are hazardous substances present or potentially present in groundwater", should be checked "yes".

Response: The requested change will be made to Attachment 2: Question 2.

Please contact me at (503) 944-7533 with any questions.

Sincerely,



Joe Mollusky
Environmental Project Manager
Properties and Development Services

cc: Bill Bach, Port
Jeff Bachrach, Ramis Crew Corrigan & Bachrach
Herb Clough, Hart Crowser
Taku Fuji, Hart Crowser
Neil Morton, Hart Crowser
Nancy Murray, Port
Tim Ralston, Ralston Investments

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bcc: David Ashton, Port
Trey Harbert, Port
Bob Teeter, Port

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